

JAPAN

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JIS D 9421 (2009) (English): Bicycles -- Rims

ISO INSIDE

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

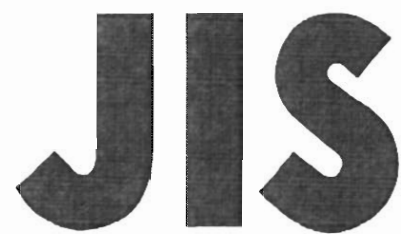
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Bicycles—Rims

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Bicycles—Rims

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of **ISO 5775-2** published in 1996 and Amendment 1 (2001) with some modifications of the technical contents.

The portions with continuous sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the rims to be used mainly for bicycles for general use and bicycles for young children as defined in **JIS D 9111** (hereafter referred to as “rims”).

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 5775-2:1996 *Bicycle tyres and rims—Part 2: Rims* and Amendment 1 (2001) (MOD)

The symbols which denote the degree of correspondence in the contents in the corresponding International Standard and **JIS** are IDT (identical), MOD (modified) and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS D 9111	<i>Cycles—Classification and essential characteristics</i>
JIS D 9112	<i>Cycle—Tyres—Dimensions</i>
JIS D 9420	<i>Rims for bicycles</i>
JIS D 9422	<i>Tire valves for bicycles</i>
JIS H 8617	<i>Electroplated coatings of nickel and chromium</i>
JIS K 6302	<i>Pneumatic tyres for bicycles</i>
ISO 5775-1	<i>Bicycle tyres and rims—Part 1: Tyre designations and dimensions</i>

3 Classification of rims and their symbols

Classification of rims and their symbols, according to the subtype and shape, are shown in table 1. Rims are classified into four types of tyres: BE rims¹⁾, WO rims²⁾ [or SS rims³⁾], HE rims⁴⁾, [or HB rims⁵⁾] and CT rims⁶⁾.

Notes ¹⁾ Abbreviation for beaded edge rim

²⁾ Abbreviation for wired on rim

³⁾ Abbreviation for straight side rim

4 Construction

The construction of rims shall be as follows.

- a) The rim shall have a smooth contour, free of sharp edges, on the side of the tyre.
- b) There shall be no visible burrs on the tyre side of the rim joint or any edge of spoke holes and valve hole.
- c) Each spoke hole should be offset alternately and equally to the centreline of rim width, with the spoke hole neighbouring the valve hole in right side being positioned upper side of that centreline in viewing the rim from outside (tyre side) as shown in figure 1.

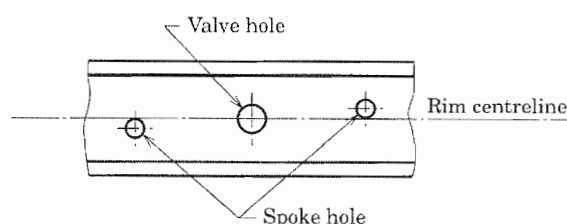


Figure 1 Position of valve hole

5 Shape and dimensions

The shape and dimensions of rims shall be as follows.

- a) Dimensions for each classification of rims are given in tables 5 to 9.

The dimensions without tolerances are recommended dimensions.

NOTE : Measured results are expected to vary owing to the difference in shape of the rims or measuring method. Therefore this Standard describes an exemplary method for measuring and gauging rim dimensions in Annex A.

- b) The spoke hole diameter of rims shall be as given in table 2.

Table 2 Spoke hole diameter

Unit: mm

Nominal spoke diameter code (JIS D 9420)	Spoke hole diameter		Nipple diameter (informative) (JIS D 9420)	
No. 12	5.0	+0.2 0	4.6	+0.2 0
No. 13	4.7		4.3	
No. 13, No. 14 or No. 15	4.4 ^{a)}		4.0	
Note ^{a)} Where spokes of nominal diameter code No. 14 apply to rim of less than 20 in diameter code or 422 in nominal diameter, the spoke hole diameter 4.4 mm should be altered to 4.5 mm.				

- c) The valve hole diameter of rims shall be as given in table 3 according to the type of tyre valve.

7 Test method

7.1 Rim strength test

A static test load (F) given in table 4 shall be applied onto the rim in a direction of the centre of rim by a means shown in figure 2 to be left in rest for a duration of 2 min and then removed, and the permanent deformation shall be measured at the point of application of load.

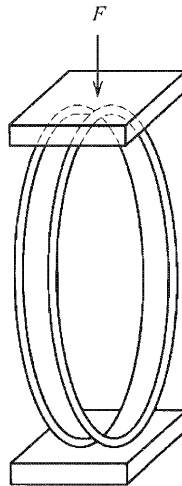


Figure 2 Rim strength test

Table 4 Test conditions

Classification	Subtype	Nominal rim width	Test load N
BE rim	BE-1	(22.2) , (25)	500
WO rim or SS rim	WO-2	(20.3)	
	WO-3	(22.5)	
	WO-5	(20.3)	
	SS	20, 22, 24, 27, 30.5	
	WO-4	(16.5)	300
	SS	18	
HE rim or HB rim	HE-1	(25)	500
	HE-5	(20)	
	HB	20, 25, 27	
CT rim	CT	19C, 21C, 23C, 25C	300
		13C, 15C, 17C	

8 Designation of products

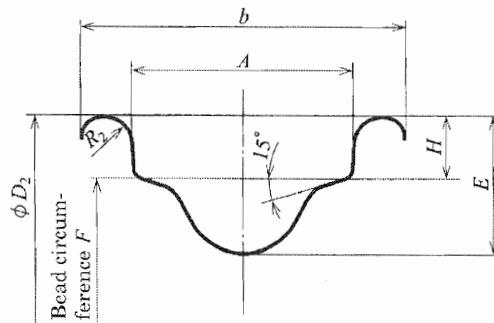
The products shall be designated as follows.

- a) BE, WO and HE rims shall be designated by the number or title of this Standard "Rims for bicycles", nominal size code, and symbol for the type of rim.

Table 6 WO or SS rims

Unit: mm

a) WO rim



Symbol	Names of parts of rim
b	Outer rim width
A	Specified rim width
D_2	Outer diameter
E	Rim height
H	Bead flange height
R_2	Flange radius

Subtype	Nominal rim size code (diameter code × width code)	Nominal rim diameter	<i>b</i>	<i>A</i>		<i>D</i> ₂	<i>E</i>		<i>F</i>		<i>H</i>	<i>R</i> ₂	Number of spoke holes (informative)		
WO-2	16×1⅜	349	28 or 26	20.3	±0.8	362	11.6	±0.8	1 097	±2	6.3	2	20		
	18×1⅜	400				413			1 257				28		
	20×1⅜	451				464			1 416				36		
	22×1⅜	501				514			1 575						
	24×1⅜	540				552			1 695						
	26×1½	584				597			1 835						
	26×1⅝	590				603			1 854						
	26×1¼	597				610			1 876					20	
	27×1⅝	630				643			1 978				28		
	27×1¼	635				647			1 994						2 016
	28×1½														
	28×1⅝														
WO-3	16×1⅜		349	32.5	22.5		362	14.1		1 097	20				
	18×1⅜		400				413			1 257	28				
	20×1⅜		451				464			1 416	36				
	22×1⅜	501	514			1 575									
	24×1⅜	540	552			1 695									
	25×1⅝	565	578			1 775									
	26×1½	584	597			1 835	20								
	26×1⅝	590	603			1 854			28						
WO-4	26×1¼	597	23	16.5	610	10.8	1 876	1.6							
	27×1¼	630			643		1 978								
	700C	622			635		1 955								
WO-5	20×1⅜	451	28 or 26	20.3	464	12.6	1 416	2	28						
	22×1⅜	501			514		1 575		36						
	24×1⅜	540			552		1 695								
	25×1⅝	565			578		1 775								
	26×1⅝	590			603		1 854								

NOTE : The method of measuring bead circumference dimension F is shown in Annex A.

Table 7 Specified and measuring rim diameter for SS rims

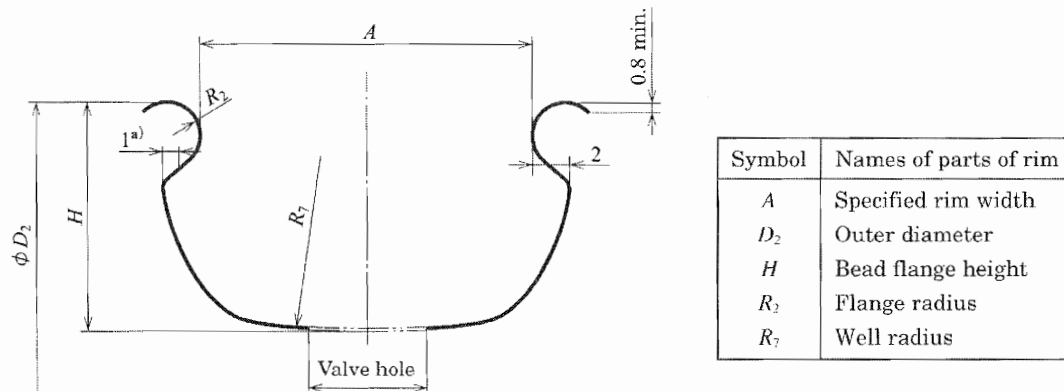
Unit: mm

Nominal rim diameter code	Specified rim diameter D	Measuring rim diameter ^{a)} D_1	Nominal rim diameter code	Specified rim diameter D	Measuring rim diameter ^{a)} D_1
194	194.2	193.85	438	437.7	437.35
203	203.2	202.85	440	439.9	439.55
222	222.2	221.85	451	450.8	450.45
239	239.4	239.05	484	484	483.65
248	247.6	247.25	489	488.6	488.25
251	250.8	250.45	490	490.2	489.85
279	279.2	278.85	498	497.5	497.15
288	287.8	287.45	501	501.3	500.95
298	298.4	298.05	507	507.3	506.95
305	304.7	304.35	520	520.2	519.85
317	317	316.65	531	530.6	530.25
330	329.8	329.45	534	533.5	533.15
337	336.6	336.25	540	539.6	539.25
340	339.6	339.25	541	540.8	540.45
349	349.2	348.85	547	546.5	546.15
355	355	354.65	559	558.8	558.45
357	357.1	356.75	565	564.9	564.55
369	368.6	368.25	571	571	570.65
381	380.9	380.55	584	583.9	583.55
387	387.1	386.75	590	590.2	589.85
390	389.6	389.25	597	597.2	596.85
400	400.1	399.75	609	609.2	608.85
406	405.6	405.25	622	622.3	621.95
419	418.6	418.25	630	629.7	629.35
428	428.1	427.75	635	634.7	634.35
432	431.6	431.25	642	641.7	641.35
NOTE : Combination of nominal rim width and nominal rim diameter should be determined referring to ISO 5775-1 .					
Note ^{a)} The tolerance on the measured bead seat circumference ($\pi \times$ measuring rim diameter) is ± 1.5 mm.					

Table 8 (concluded)

Unit: mm

b) **HB rim**



Note ^{a)} Optional opening not to exceed 1 mm.

Nominal rim width	A	H	R_2	R_7
	± 1	min.	± 0.5	min.
20	20	13	2	30
25	25	14	2	50
27	27	15	2	70

Specified rim diameter and circumference for HB rims

Nominal rim diameter code	Specified rim diameter D	Specified rim circumference πD + 2.5
270	269.9	847.9
321	320.7	1 007.5
372	371.5	1 167.1
422	422.3	1 326.7
459	458.8	1 441.4
473	473.1	1 486.3
510	509.6	1 601
524	523.9	1 645.9
560	560.4	1 760.6
575	574.7	1 805.5
611	611.2	1 920.1

NOTE: Combination of nominal rim width and nominal rim diameter should be determined referring to **ISO 5775-1**.

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal of revision of Japanese Industrial Standard submitted by Japan Bicycle Promotion Institute (JBPI)/ Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS D 9421:2005** is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

Bicycles—Rims

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JIS D 9112	<i>Cycle—Tyres—Dimensions</i>
JIS D 9420	<i>Rims for bicycles</i>
JIS D 9422	<i>Tire valves for bicycles</i>
JIS H 8617	<i>Electroplated coatings of nickel and chromium</i>
JIS K 6302	<i>Pneumatic tyres for bicycles</i>
ISO 5775-1	<i>Bicycle tyres and rims—Part 1: Tyre designations and dimensions</i>

3 Classification of rims and their symbols

Classification of rims and their symbols, according to the subtype and shape, are shown in table 1. Rims are classified into four types of tyres: BE rims¹⁾, WO rims²⁾ [or SS rims³⁾], HE rims⁴⁾, [or HB rims⁵⁾] and CT rims⁶⁾.





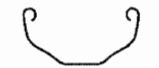


Notes ¹⁾ Abbreviation for beaded edge rim

²⁾ Abbreviation for wired on rim

³⁾ Abbreviation for straight side rim

- 4) Abbreviation for hooked edge rim
5) Abbreviation for hooked bead rim
6) Abbreviation for crotchet rim

Table 1 Classification of rims and their symbols

Classification (symbol)	Subtype	Nominal rim width ^{a)}	Example of shape
<u>BE rim ^{b)} (BE)</u>	<u>BE-1</u>	(22.2) (25)	
<u>WO rim (WO) or SS rim ^{c)} (SS)</u>	<u>WO-2</u>	(20.3)	
	<u>WO-4</u>	(16.5)	
	<u>WO-3</u> <u>WO-5</u>	(22.5) (20.3)	
	<u>SS</u>	18, 20, 22, 24, 27, 30.5	
<u>HE rim (HE) or HB rim ^{d)} (HB)</u>	<u>HE-1</u>	(25)	
	<u>HE-5</u>	(20)	
	<u>HB</u>	20, 25, 27	
<u>CT rim ^{e)}</u>	<u>CT</u>	13C, 15C, 17C, 19C, 21C, 23C, 25C	

NOTE 1 For SS, HB and CT rims, corresponding to the rims specified in **ISO 5775-2**, and having no external width dimension specifications, the shape examples are given by chain double dashed lines.

NOTE 2 The width and thickness of rim tape shall be chosen in such a way as to guarantee the complete covering of the spoke heads and spoke holes during use, as well as a stable fit, and to permit satisfactory fitting of the tyre and tube.

Notes ^{a)} The nominal rim width is shown as dimension A in each of the figures in tables 5, 6, 8 and 9. The nominal widths in parentheses are not used as part of the rim designations.

^{b)} BE rims are compatible with BE tyres defined in **JIS D 9112**.

^{c)} WO rims or SS rims, and CT rims are compatible with WO tyres specified in **JIS D 9112** and "wired edge" tyres specified in **ISO 5775-1**. WO rims or SS rims are to be used only with tyres using bead wires of hard drawn wire specified in **JIS K 6302**. Tyres using bead wires of aramid fibre may also be used, provided that they meet the rim running-off resistance requirement specified in **JIS K 6302**. CT rims are to be used with tyres using bead wires of hard drawn wire and of aramid fibre.

^{e)} HE or HB rims are compatible with HE tyres of **JIS D 9112** and "beaded edge" tyres of **ISO 5775-1**.

4 Construction

The construction of rims shall be as follows.

- a) The rim shall have a smooth contour, free of sharp edges, on the side of the tyre.
- b) There shall be no visible burrs on the tyre side of the rim joint or any edge of spoke holes and valve hole.
- c) Each spoke hole should be offset alternately and equally to the centreline of rim width, with the spoke hole neighbouring the valve hole in right side being positioned upper side of that centreline in viewing the rim from outside (tyre side) as shown in figure 1.

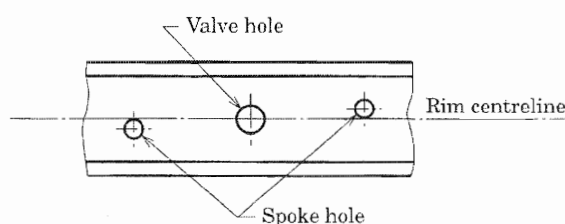


Figure 1 Position of valve hole

5 Shape and dimensions

The shape and dimensions of rims shall be as follows.

- a) Dimensions for each classification of rims are given in tables 5 to 9.

The dimensions without tolerances are recommended dimensions.

NOTE : Measured results are expected to vary owing to the difference in shape of the rims or measuring method. Therefore this Standard describes an exemplary method for measuring and gauging rim dimensions in Annex A.

- b) The spoke hole diameter of rims shall be as given in table 2.

Table 2 Spoke hole diameter

Unit: mm

Nominal spoke diameter code (JIS D 9420)	Spoke hole diameter		Nipple diameter (informative) (JIS D 9420)	
No. 12	5.0	+0.2	4.6	+0.2
No. 13	4.7	0	4.3	0
No. 13, No. 14 or No. 15	4.4 ^{a)}		4.0	
Note ^{a)} Where spokes of nominal diameter code No. 14 apply to rim of less than 20 in diameter code or 422 in nominal diameter, the spoke hole diameter 4.4 mm should be altered to 4.5 mm.				

- c) The valve hole diameter of rims shall be as given in table 3 according to the type of tyre valve.

Table 3 Classification of tyre valve hole diameters

Unit: mm

Type of tyre valve (JIS D 9422)		Valve hole diameter	
Woods valve	VEM, VER	8.2	±0.1
Schrader valve ^{a)}	VAM	8.2	
	VAR	8.7	
Presta valve	VFM, VFR	6.3	
Note ^{a)} A schrader valve with body diameter of 8 mm is applicable to valve hole diameter 8.2 mm.			

- d) The mutual pitch error of spoke holes shall be at most 2 mm.
- e) The difference of rim diameter dimensions (diameter distortion) between the measurements on optional two portions at an interval equivalent to two spoke hole pitches, shall be 1 mm or less.
- f) The plane distortion of rim, determined by the measurement on optional two portions at an interval of equivalent to two spoke hole pitches, shall be 0.3 mm or less.

6 Quality

6.1 Appearance

The appearance of rims shall be as follows.

- a) There shall be no exposure of substrate, peeling, rust, or other visible defects on the surfaces subjected to plating or cosmetic process.

Further, the surfaces to appear externally after assembly into a wheel shall be free from visible unevenness of plating.

- b) There shall be no rust, cracks, visible scratches or other defects on the surfaces without application of plating nor cosmetic process.
- c) Marks shall be free from incomplete stamping, positional deviation, blur, irregular colouring and other visible defects.

6.2 Plating

The thickness and corrosion resistance of plating applied on the rim surface shall be at least Grade 3 of table 2 specified in **JIS H 8617**, except the portions to be not exposed after assembly into a wheel or processed after plating.

6.3 Strength

The strength of the rim shall be such that, when it is subjected to the test in **7.1**, the permanent deformation measured shall be 1 mm or less.

7 Test method

7.1 Rim strength test

A static test load (F) given in table 4 shall be applied onto the rim in a direction of the centre of rim by a means shown in figure 2 to be left in rest for a duration of 2 min and then removed, and the permanent deformation shall be measured at the point of application of load.

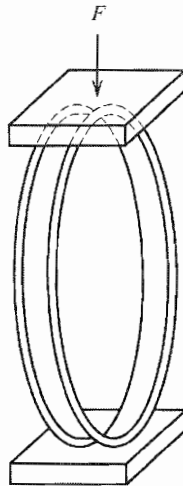


Figure 2 Rim strength test

Table 4 Test conditions

Classification	Subtype	Nominal rim width	Test load N
BE rim	BE-1	(22.2) , (25)	500
WO rim or SS rim	WO-2	(20.3)	
	WO-3	(22.5)	
	WO-5	(20.3)	
	SS	20, 22, 24, 27, 30.5	
	WO-4	(16.5)	300
	SS	18	
HE rim or HB rim	HE-1	(25)	500
	HE-5	(20)	
	HB	20, 25, 27	
CT rim	CT	19C, 21C, 23C, 25C	300
		13C, 15C, 17C	

8 Designation of products

The products shall be designated as follows.

- a) BE, WO and HE rims shall be designated by the number or title of this Standard "Rims for bicycles", nominal size code, and symbol for the type of rim.

Example 1 **JIS D 9421** 26 × 1 $\frac{3}{8}$ WO

Example 2 Rims for bicycles 26 × 1 $\frac{3}{8}$ WO

- b) SS and HB rims shall be designated by the number or title of this Standard “Rims for bicycles”, symbol of type of the rim, nominal rim diameter and nominal rim width.

Example 1 **JIS D 9421** SS 349 × 20

Example 2 Rims for bicycles SS 349 × 20

- c) CT rims shall be designated by the number or title of this Standard “Rims for bicycles”, nominal rim diameter, nominal rim width and “C” denoting CT rim.

Example 1 **JIS D 9421** 622 × 13C

Example 2 Rims for bicycles 622 × 13C

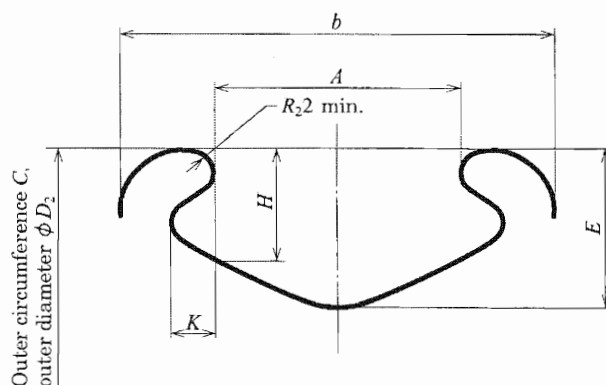
9 Marking

Rims shall be marked with the following items at a conspicuous place and by means indelible.

- Manufacturer's name or its abbreviation
- Year and month of manufacture or their abbreviation
- Nominal size code (or nominal diameter and nominal width for SS, HB, and CT rims)
- Symbol of type of the rim (“C” for CT rims)

Table 5 BE rims

Unit: mm



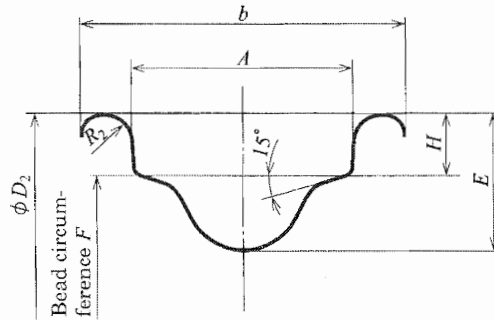
Symbol	Names of parts of rim
b	Outer rim width
A	Specified rim width
C	Outer circumference
D_2	Outer diameter
E	Rim height
H	Bead flange height
K	Edge depth
R_2	Flange radius

Subtype	Nominal rim size code (diameter code × width code)	b	A		C		D_2	E		H	K	Number of spoke holes (informative)
BE-1	$26 \times 1\frac{3}{8}$	40	22.2	± 0.8	1 885	± 3	600	14.9	± 0.8	10.5	4	32 or 40
	$26 \times 1\frac{1}{2}$											
	$26 \times 1\frac{3}{4}$	44	25				1 885			600	16.3	

Table 6 WO or SS rims

Unit: mm

a) WO rim



Symbol	Names of parts of rim
b	Outer rim width
A	Specified rim width
D_2	Outer diameter
E	Rim height
H	Bead flange height
R_2	Flange radius

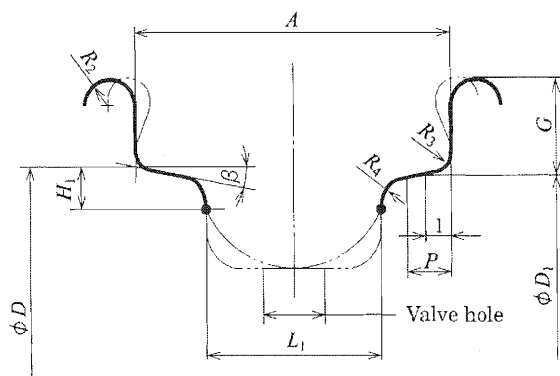
Subtype	Nominal rim size code (diameter code × width code)	Nominal rim diameter	b	A		D_2	E		F		H	R_2	Number of spoke holes (informative)
WO-2	16×1⅜	349	28 or 26	20.3	±0.8	362	11.6	±0.8	1 097	±2	6.3	2	20
	18×1⅜	400				413			1 257				28
	20×1⅜	451				464			1 416				36
	22×1⅜	501				514			1 575				
	24×1⅜	540				552			1 695				
	26×1½	584				597			1 835				
	26×1⅜	590				603			1 854				
	26×1¼	597				610			1 876				
	27×1⅜	630				643			1 978				
	27×1¼												
	28×1½	635				647			1 994				
	28×1⅜	642				655			2 016				
	WO-3	16×1⅜				349			32.5				22.5
18×1⅜		400	413	1 257	28								
20×1⅜		451	464	1 416	36								
22×1⅜		501	514	1 575									
24×1⅜		540	552	1 695									
25×1⅜		565	578	1 775									
26×1½		584	597	1 835									
26×1⅜		590	603	1 854									
WO-4	26×1¼	597	23	16.5		610	10.8		1 876		1.6	2	28
	27×1¼	630			643	1 978							
	700C	622			635	1 955							
WO-5	20×1⅜	451	28 or 26	20.3		464	12.6		1 416			2	28
	22×1⅜	501			514	1 575		36					
	24×1⅜	540			552	1 695							
	25×1⅜	565			578	1 775							
	26×1⅜	590			603	1 854							

NOTE : The method of measuring bead circumference dimension F is shown in Annex A.

Table 6 (concluded)

Unit: mm

b) **SS rim**



Symbol	Names of parts of rim
A	Specified rim width
D	Specified rim diameter
D_1	Measuring rim diameter
G	Flange height
P	Bead seat width
H_1	Unobstructed minimum depth above rim base with rim tape fitted to permit tyre fitment
L_1	Well width above rim tape
R_2	Flange radius
R_3	Bead seat radius
R_4	Well top radius
β	Bead seat angle

Nominal rim width	A	G	P	H_1 ^{a) b)}	L_1 ^{b)}	R_2	R_3	R_4	β ^{c)}
	± 1	± 0.5	min.	min.	min.	min.	max.	min.	$\pm 5^\circ$
18 ^{d)}	18	6.5	1.8	1.8	10	1.5	1	1.5	10°
20	20	6.5	2	2	11	1.8	1	1.5	10°
22	22	6.5	2.2	3	11	1.8	1	2	10°
24	24	7	3	3	11	2	1	2.5	10°
27	27	7.5	3.5	3.5	14	2.5	1	2.5	10°
30.5	30.5	8	3.5	3.5	14	2.5	1	2.5	10°

Notes ^{a)} For 400 mm diameter and smaller, increase depth H_1 by 1 mm.

^{b)} The dimension H_1 in conjunction with dimension L_1 defines the unobstructed space above the rim base and the nipple heads, with the rim tape fitted, to permit satisfactory tyre fitment. The actual well depth of the rim shall be defined at the discretion of rim manufacturers to achieve this objective.

^{c)} For SS rims with nominal rim diameter of 400 mm and smaller, $\beta = 15^\circ \pm 10^\circ$.

^{d)} The tolerance of A shall be $\begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$.

Table 7 Specified and measuring rim diameter for SS rims

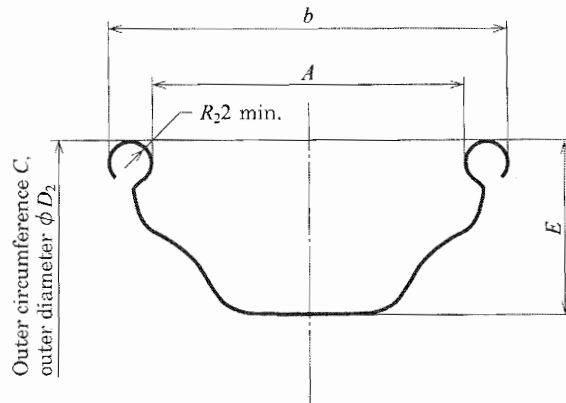
Unit: mm

Nominal rim diameter code	Specified rim diameter D	Measuring rim diameter ^{a)} D_1	Nominal rim diameter code	Specified rim diameter D	Measuring rim diameter ^{a)} D_1
194	194.2	193.85	438	437.7	437.35
203	203.2	202.85	440	439.9	439.55
222	222.2	221.85	451	450.8	450.45
239	239.4	239.05	484	484	483.65
248	247.6	247.25	489	488.6	488.25
251	250.8	250.45	490	490.2	489.85
279	279.2	278.85	498	497.5	497.15
288	287.8	287.45	501	501.3	500.95
298	298.4	298.05	507	507.3	506.95
305	304.7	304.35	520	520.2	519.85
317	317	316.65	531	530.6	530.25
330	329.8	329.45	534	533.5	533.15
337	336.6	336.25	540	539.6	539.25
340	339.6	339.25	541	540.8	540.45
349	349.2	348.85	547	546.5	546.15
355	355	354.65	559	558.8	558.45
357	357.1	356.75	565	564.9	564.55
369	368.6	368.25	571	571	570.65
381	380.9	380.55	584	583.9	583.55
387	387.1	386.75	590	590.2	589.85
390	389.6	389.25	597	597.2	596.85
400	400.1	399.75	609	609.2	608.85
406	405.6	405.25	622	622.3	621.95
419	418.6	418.25	630	629.7	629.35
428	428.1	427.75	635	634.7	634.35
432	431.6	431.25	642	641.7	641.35
NOTE : Combination of nominal rim width and nominal rim diameter should be determined referring to ISO 5775-1 .					
Note ^{a)} The tolerance on the measured bead seat circumference ($\pi \times$ measuring rim diameter) is ± 1.5 mm.					

Table 8 HE or HB rims

Unit: mm

a) HE rim



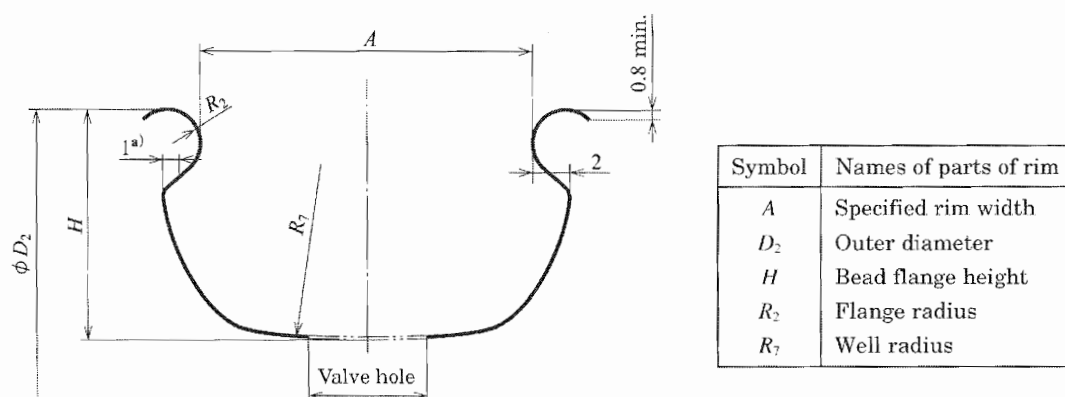
Symbol	Names of parts of rim
b	Outer rim width
A	Specified rim width
C	Outer circumference
D_2	Outer diameter
E	Rim height
R_2	Flange radius

Subtype	Nominal rim size code (diameter code × width code)	Nominal rim diameter code	<i>b</i>	<i>A</i>		<i>C</i>		<i>D</i> ₂	<i>E</i>		Number of spoke holes (informative)
HE-1	12½ × 2¼	—	33	25	±0.8	691	±3	220	14.8	±0.8	20
	14 × 1.75	HB 270				848		270			20 or 28
	16 × 1.75	HB 321				1 007		321			
	18 × 1.75	HB 372				1 167		371			28
	20 × 1.75	HB 422				1 327		422			36
	22 × 1.75	HB 473				1 486		473			
	24 × 1.75	HB 524				1 646		524			
	26 × 1.75	HB 575				1 805		575			
HE-5	14 × 1.50	HB 270	28	20		848		270	14.0		20
	16 × 1.50	HB 321				1 007		321			20 or 28
	18 × 1.50	HB 372				1 167		371			28
	20 × 1.50	HB 422				1 327		422			
	22 × 1.50	HB 473				1 486		473			

Table 8 (concluded)

Unit: mm

b) HB rim



Note a) Optional opening not to exceed 1 mm.

Nominal rim width	A	H	R_2	R_7
	± 1	min.	± 0.5	min.
20	20	13	2	30
25	25	14	2	50
27	27	15	2	70

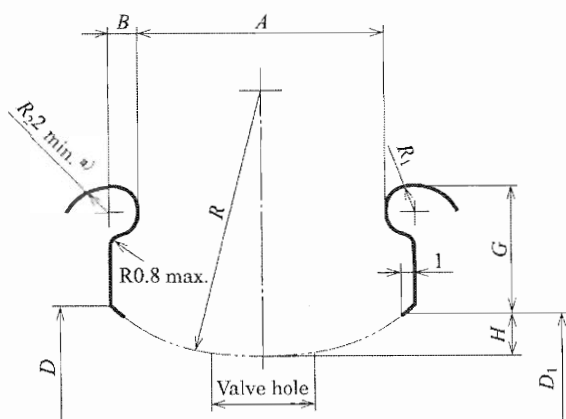
Specified rim diameter and circumference for HB rims

Nominal rim diameter code	Specified rim diameter D	Specified rim circumference πD ± 2.5
270	269.9	847.9
321	320.7	1 007.5
372	371.5	1 167.1
422	422.3	1 326.7
459	458.8	1 441.4
473	473.1	1 486.3
510	509.6	1 601
524	523.9	1 645.9
560	560.4	1 760.6
575	574.7	1 805.5
611	611.2	1 920.1

NOTE: Combination of nominal rim width and nominal rim diameter should be determined referring to **ISO 5775-1**.

Table 9 CT rims

Unit: mm



Symbol	Names of parts of rim
<i>A</i>	Specified rim width
<i>B</i>	Hook width
<i>D</i>	Specified rim diameter
<i>D₁</i>	Measuring rim diameter
<i>G</i>	Flange height
<i>H</i>	Bead flange height
<i>R₁</i>	Crotchet radius
<i>R₂</i>	Flange radius

Note ^{a)} Flange edge R_2 min. shall guarantee a smooth, non-aggressive surface in order not to damage the tyre.

Nominal rim width code	A ± 0.5	B ± 0.3	G ± 0.5	$H^{b)}$ min.	$R_1^{b)}$
13C	13	1.5	5.5	2.2	0.9 ± 0.1
15C	15				
17C	17				
19C	19		6.5	3.5	$1.1^{+0.2}_{-0.1}$
21C	21				
23C	23			4.5	
25C	25				
NOTE : The nominal rim diameter code shall be the same as SS rims, as shown in table 7.					
Note ^{b)} Dimensions H and R_1 define the minimum unobstructed space above the rim base and nipple heads, with the rim tape fitted, to permit satisfactory type fitment on a crotchet type rim.					

Annex A (informative)

Methods for measuring and gauging bicycle rim dimensions

Introduction

This Annex is to supplement the matters related to the text and not to constitute a part of the provisions of this Standard.

A.1 Purpose

This Annex gives methods for measuring and gauging dimensions of SS, HB, CT and WO rims.

NOTE : The bead circumference F of WO rims specified in table 6 shall be measured with a measuring tape having cross-sectional dimensions given in the following table A.1.

Table A.1 Tape dimensions

Unit: mm

Specified rim width A	Cross-sectional dimensions of tape		
	Width		Thickness
16.5	15.3	±0.3	0.30+0.05
20.3	19.1		
22.5	21.3		

A.2 General

All measurements shall be made on rims ready for tyre mounting and placed on flat surfaces. For accurate measurements, the steel measure, gauges and measuring tape (so referred to in **ISO 5775-2**) shall always be set perpendicular to the rim flanges on both bead seats.

A.3 Main rim dimensions to be measured by using steel measure

The main rim dimensions to be measured by using steel measure are indicated in figures A.1, A.2 and A.3.

Unit: mm

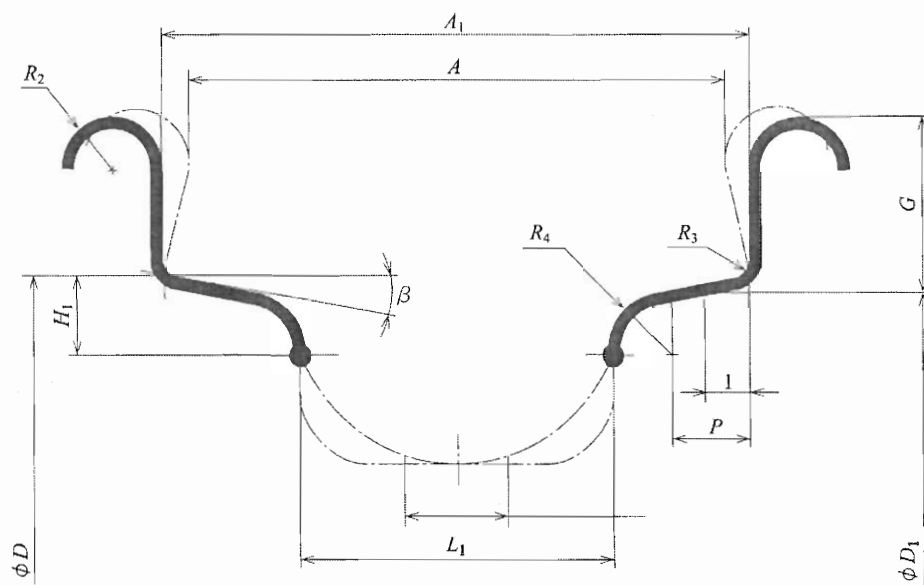


Figure A.1 SS rims

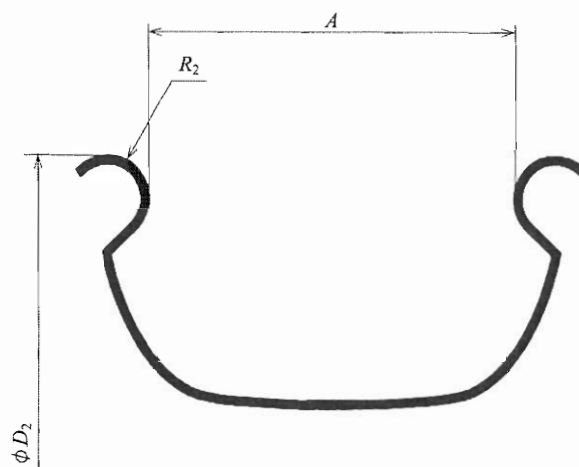


Figure A.2 HB rims

Unit: mm

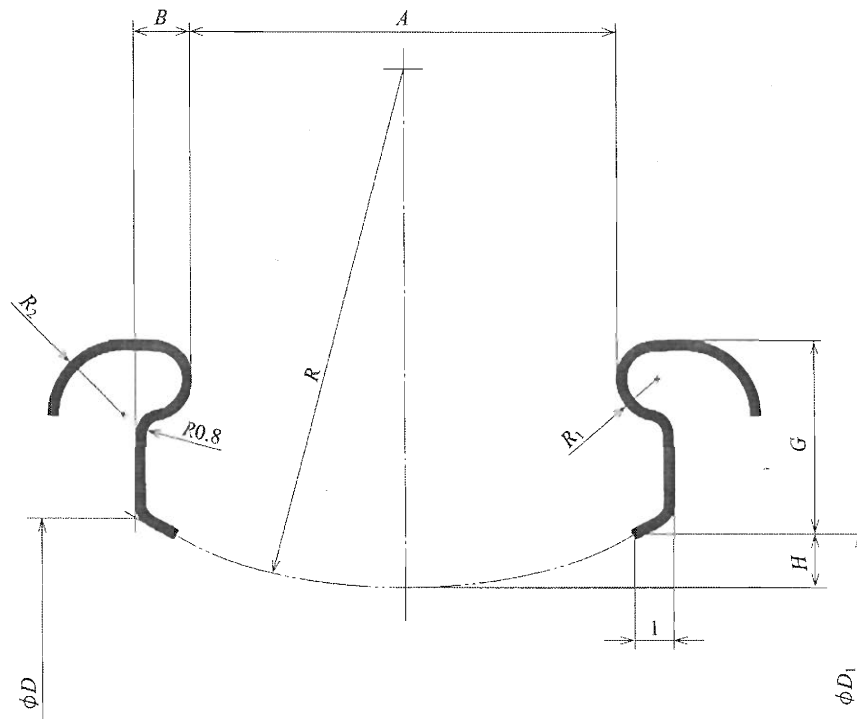


Figure A.3 CT rims

A.4 Methods of measuring specified diameter and bead seat circumference

The first method (A.4.1) is applicable for SS rims only. The second method (A.4.2) is applicable for SS and CT rims.

A.4.1 First method

The rim measurement is made around a standard level circumference related to the mandrel circumference. A measuring tape as illustrated in figure A.4 is used. The tape shall be made of spring steel and contact the rim on both bead seats equally; it shall be marked with details of the rim width code and nominal rim diameter. The tape of which the length shall also be checked on an appropriate mandrel to the corresponding rim bead diameter or on a flat surface. These measurement and checking shall be made in such a way as whether the straight end of the tape, put equally around the rim bead seal or mandrel circumference, can contact the other end within the 3 mm notch (see table A.2, figure A.4, figure A.5 and figure A.6).

The reference temperature for the measurement shall be 20 °C.

It is recommended that, except for experienced rim inspectors, two persons make the measurement — one holding the tape in position and applying not more than 50 N pull on the ends, and the other taking the readings.

A.4.2 Second method

The circumference of the upper part of both flanges (D_1 in figure A.4) is measured by means of an inextensible steel tape-line (10 mm width and 0.3 mm thickness, with

0.5 mm graduations), care being taken that it contacts the rim. The two outer circumference measurements U_{0A} and U_{0B} are recorded.

Using an appropriate vernier gauge (see figures A.7 to A.9), measure the height of both flanges at several points around the circumference and calculate the average of the height for the two flanges, G_A and G_B .

Calculate the measured circumferences, U_{1A} and U_{1B} , using the following equations: to obtain relating to outer circumferences

$$U_{1A} = U_{0A} - 2\pi G_A$$

$$U_{1B} = U_{0B} - 2\pi G_B$$

to obtain relating to rim radii

$$\frac{U_{1A}}{2\pi} = \frac{U_{0A}}{2\pi} - G_A$$

$$\frac{U_{1B}}{2\pi} = \frac{U_{0B}}{2\pi} - G_B$$

Compare both circumferences with the product of D_1 values shown in table 7 by π .

NOTE : When rims have a difference of more than 2 mm between the two outer circumferences U_{0A} and U_{0B} , the vernier gauge should be appropriately applied and a spacer with a thickness δ , catering for the difference in circumference, inserted (see figure A.8).

$$\delta = \frac{|U_{0A} - U_{0B}|}{2\pi}$$

The spacer should be interposed between the top of the shorter flange and the vernier gauge as shown in figure A.8.

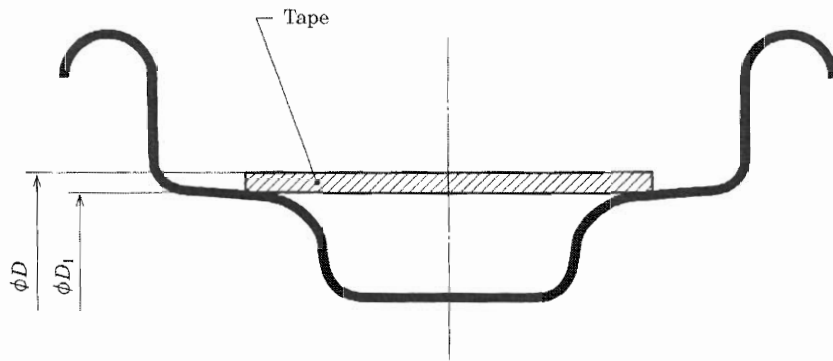


Figure A.4 Rim diameter measurement

Unit: mm

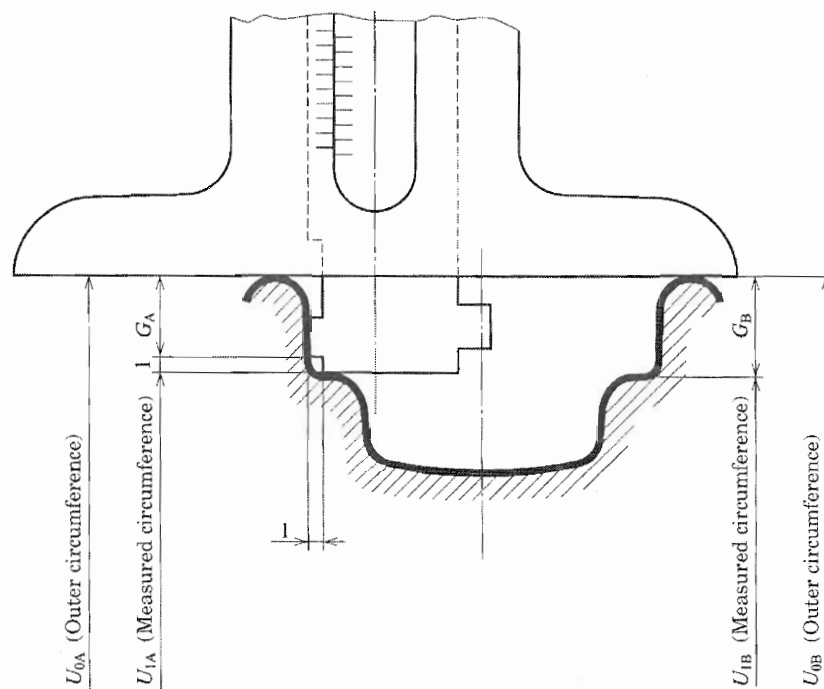


Figure A.4 (concluded)

Unit: mm

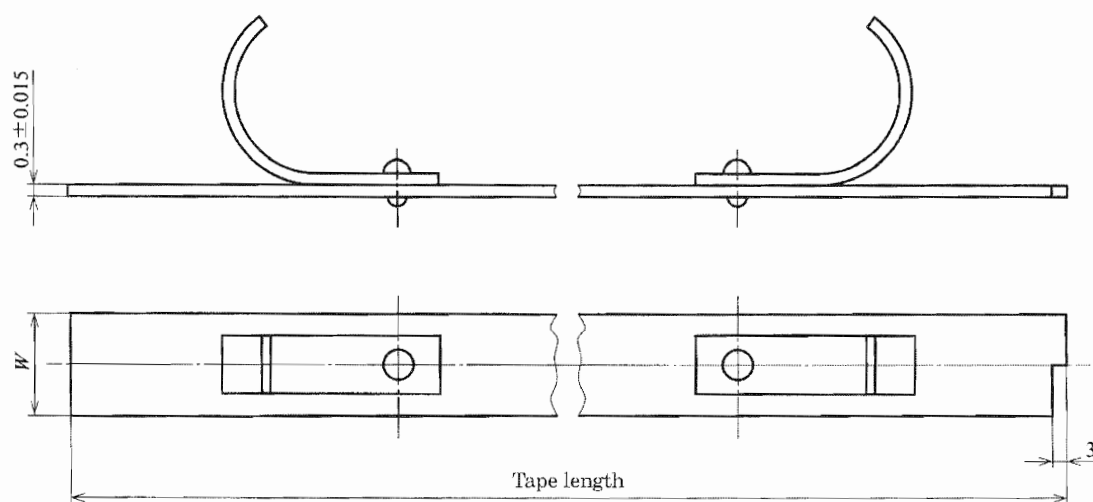


Figure A.5 Tape dimensions

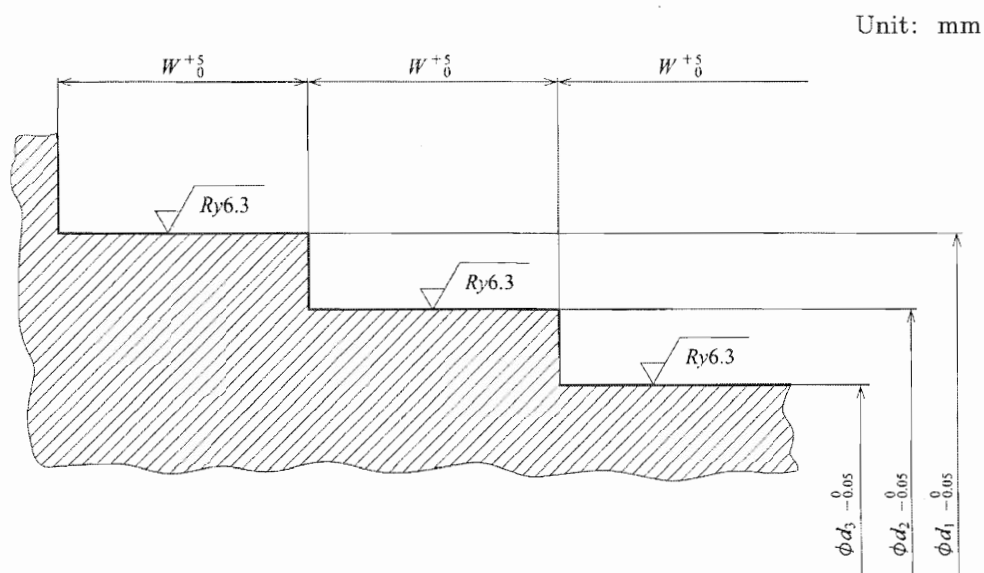


Figure A.6 Tape checking mandrel

Table A.2 Rim and tape widths

Unit: mm

Rim width	Tape width W 0 -0.1
18	16
20	18
22	20
24	22
27	25
30.5	28.5

Unit: mm

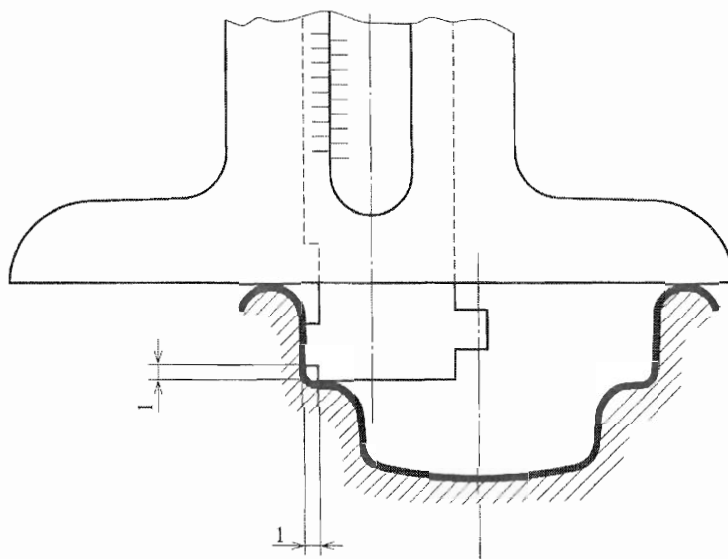


Figure A.7 Vernier gauge with 1/20 mm graduations

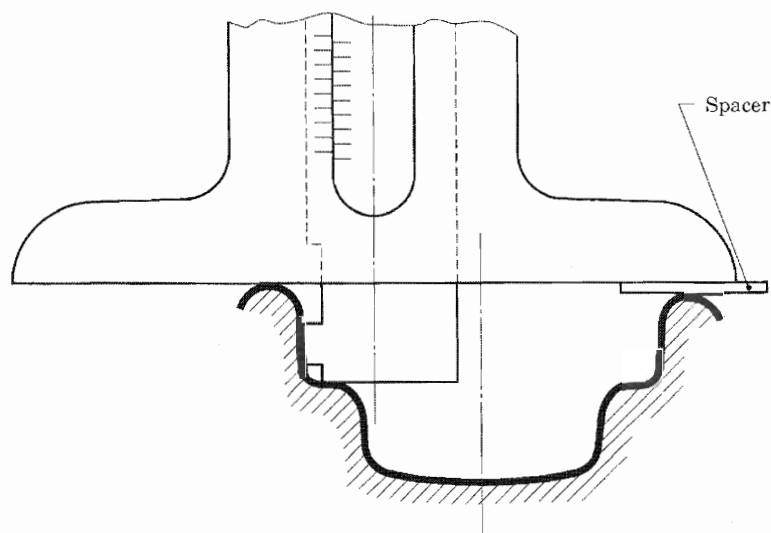
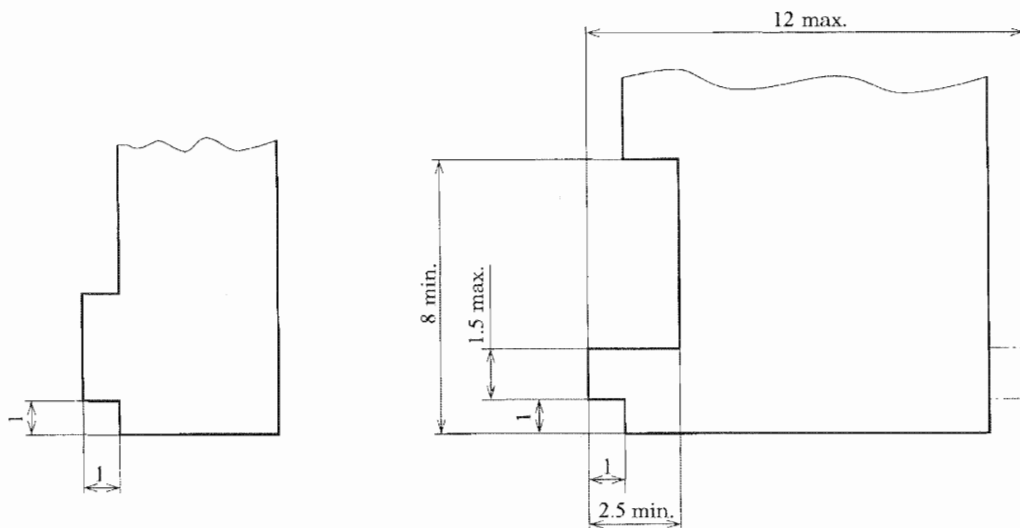


Figure A.8 Use of vernier gauge with spacer

Unit: mm



a) For SS rims

b) For CT rims

Figure A.9 Vernier gauge details for measuring flange height G

A.5 Measuring well width above rim tape

See figures A.10 and A.11.

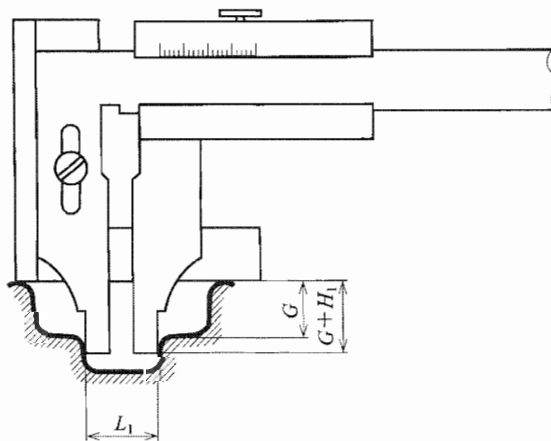


Figure A.10 Measuring principle of well width above tape L_1

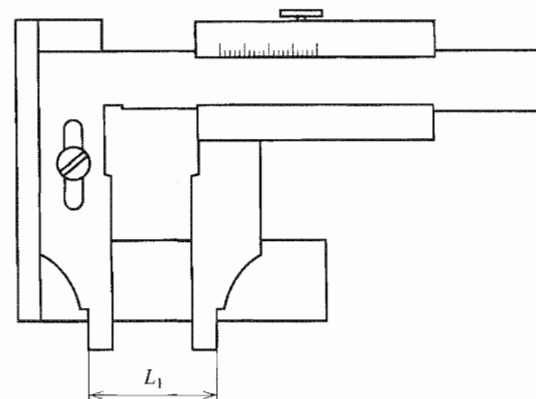


Figure A.11 Calliper vernier for measuring dimension L_1

A.6 Measuring of bead seat angle, β

See figures A.12 and A.13.

Unit: mm

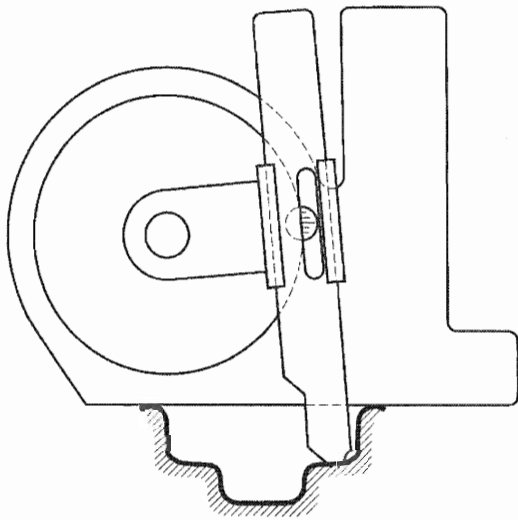


Figure A.12 Measuring principle of bead seat angle, β

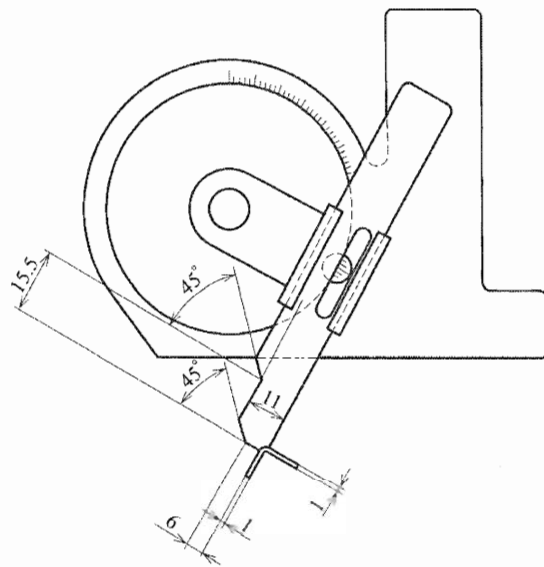


Figure A.13 Tools for measuring β

A.7 Measuring other rim dimensions

The rim width at the bead seat, A_1 , and the specified rim width, A , should be measured with a calliper vernier as illustrated in figure A.14.

Unit: mm

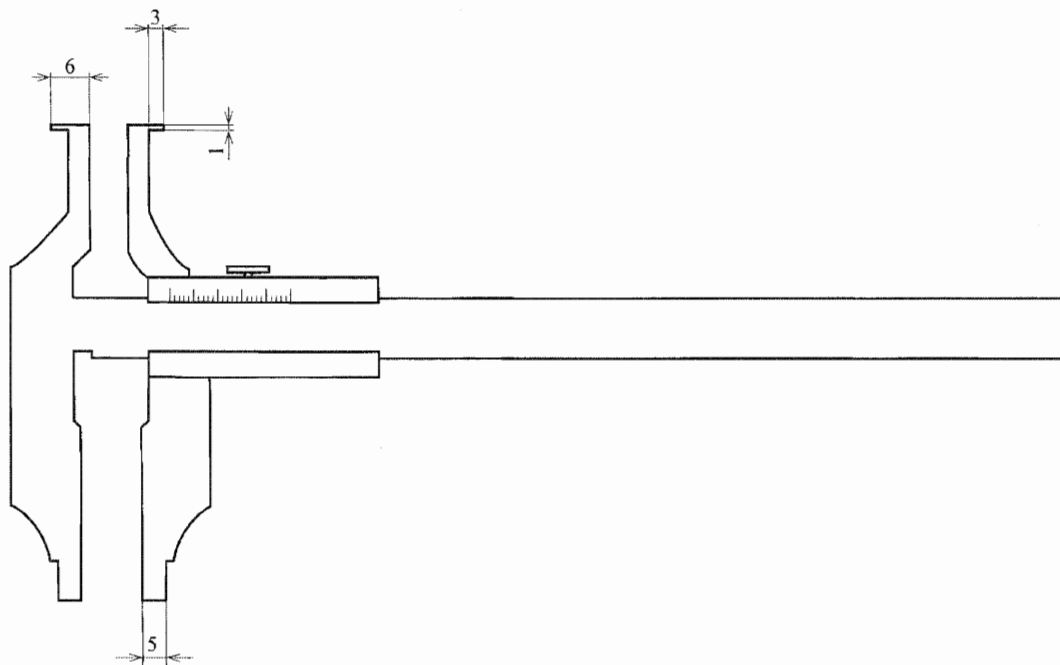


Figure A.14 Calliper vernier for measuring rim width

Annex JA (informative)

Comparison table between JIS and corresponding International Standard

JIS D 9421 : 2009 <i>Bicycles—Rims</i>			ISO 5775-2 : 1996 <i>Bicycle tyres and rims—Part 2: Rims</i> and Amendment 1 (2001)				
(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
1 Scope	Rims to be used for general-use bicycles and children's bicycles as defined in JIS D 9111 are specified.		1	Rim dimensions for bicycle tyres are specified.	Addition	In JIS, strength and appearance of rims are also specified.	JIS added this specification for assurance of product safety and quality.
2 Normative references							
3 Classification of rims and their symbols	<p>Symbols to designate 6 types of rims (BE, WO, SS, HE, HB, and CT) are specified.</p> <p>Rims are classified into four types: BE, WO or SS, HE or HB, and CT.</p>		4	<p>ISO covers SS, HB, and C rims.</p> <p>ISO covers SS, HB, and C rims (3 types).</p>	<p>Addition</p> <p>Addition</p>	<p>In JIS, WO, HE, BE are added and C is referred to as CT.</p> <p>In JIS, BE is added and SS is divided into WO and SS, and HB into HE and HB.</p>	<p>In JIS, in order to meet the needs in the market in Japan, BE rims for heavy duty transportation are added, and SS rims are divided into WO and SS rims, and HB rims are divided into HE and HB rims.</p> <p>To avoid confusion, relation of these rims to the relevant ISO specifications is explained in notes.</p>

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
	<p>Note ^{b)} BE rims are compatible with BE tyres.</p> <p>Note ^{c)} WO, SS, and CT rims are compatible with WO tyres, and the wired edge tyres specified in ISO.</p> <p>WO and SS rims are to be used with tyres using hard drawn bead wires, and may also be used with bead wires of aramid fibre if conformance is confirmed.</p> <p>CT rims are to be used with bead wires of hard drawn wire or aramid fibre.</p> <p>Note ^{d)} HE and HB rims are compatible with HE tyres and beaded edge tyres in ISO.</p> <p>NOTE 1 SS, HB and CT rims correspond to the rims specified in ISO.</p>		4.1	“Wired edge” tyres to be fitted with SS or C rims.	Addition		
			6.1	SS rims are used only with non-foldable tyres (rigid bead tyres).			
			5	C rims can be used with rigid and foldable bead tyres.			
4 Construction	c) Position of spoke hole			—	Addition	In JIS , specification of spoke hole position is added.	JIS added this specification for assurance of product strength and safety.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
5 Shape and dimensions	a) Dimensions of respective parts of rims are specified according to the classification of rims.		2, 4.1, 5.1, 6.1	Dimensions of SS, HB, and C rims are identical with those of JIS . WO, BE, and HE rims are not specified.	Addition	In JIS , dimensions of WO, BE and HE rims are added.	WO, BE and HE rims are added since they have an established needs in Japanese market.
	b) Spoke hole diameters of rims are specified.			—	Addition	Additional item in JIS .	JIS added this specification for assurance of product strength and safety.
	c) Valve hole diameters of rims are specified.		3.2	The rim valve hole shall be centred on the bottom of the rim well.	Addition	In JIS , valve hole diameters are additionally specified.	JIS added this specification for assurance of product strength and quality.
	d) The mutual pitch error of spoke hole shall be at most 2 mm.			—	Addition	This specification item is added to JIS .	JIS added this specification to ensure product quality.
	e) The rim diameter distortion shall be 1 mm or less.			—	Addition	This specification item is added to JIS .	JIS added this specification to ensure product quality.
	f) The rim plane distortion shall be 0.3 mm or less.			—	Addition	This specification item is added to JIS .	JIS added this specification to ensure product quality.
6 Quality	Appearance of rims (related to plating or marking, etc.) is specified.			—	Addition	In JIS , appearance of plating, cosmetic process, and marks is additionally specified.	JIS added this specification to ensure product quality.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
	6.3 Strength The strength of rims is to be tested in accordance with 7.1 and the permanent deformation shall be 1 mm or less.			—	Addition	This specification item is added to JIS .	JIS added this specification to ensure product safety.
7 Test method	7.1 Strength of rims Permanent deformation resulting from the application of test load given in table 4 for 2 min is measured.			—	Addition	This specification item is added to JIS .	JIS added this specification to ensure product safety.
8 Designation of products	BE, WO, HE: (symbol of tyre outer diameter in inch) × (symbol of tyre width in inch) and type SS, HB: type of rim and (nominal rim diameter) × (nominal rim width) CT: (nominal rim diameter) × (nominal rim diameter) × (nominal rim width) and type of rim		4.3	SS: Type of rim and (nominal rim diameter) × (nominal rim width)	Addition	For SS, HB, and CT rims, ISO and JIS specifications are identical. For WO, HE and BE rims, in JIS , rims are designated by the diameters of mating tyres, and the symbols are in inch.	In Japan, it has been a longtime convention to designate the rims by the nominal diameters of the mating tyres, and changing this method of designation altogether is expected to cause much confusion among users. Since SS, HB and CT rims are a perfect match with ISO specification, this will not cause a problem.
			5.3	HB: Type of rim and (nominal rim diameter) × (nominal rim width)			
			6.3	C: (nominal rim diameter) × (nominal rim width) and type of rim			

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between JIS and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		Clause No.	Content	Classification by clause	Detail of technical deviation	
9 Marking	Information to be marked on rims: manufacturer's name, month and year of manufacture, nominal size code (for SS, HB and CT rims, nominal rim diameter and nominal rim width), symbol of type of rim.		4.3, 5.3, 6.3	Type of rim, nominal rim diameter and nominal width are to be marked.	Addition	In JIS , manufacturer's name and year and month of manufacture are to be included in the marking.	JIS added this specification for the consumers' convenience.
Annex A (informative)	Methods for measuring and gauging bicycle rim dimensions		Annex A (informative)				

Overall degree of correspondence between **JIS** and International Standard (**ISO 5775-2**: 1996 and Amendment 1:2001): MOD

NOTE 1 Symbol in sub-columns of classification by clause in the above table indicates as follows:

— Addition: Adds the specification item(s) or content(s) which are not included in International Standard.

NOTE 2 Symbol in column of overall degree of correspondence between **JIS** and International Standard in the above table indicates as follows:

— MOD: Modifies International Standard.

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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